

## A new giant leaf insect species of the genus *Phyllium* from Thailand (Phasmatodea, Phylliidae)

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**Abstract.** – A new species of leaf insect is described from Thailand, *Phyllium (Pulchriphyllium) maethoraniae* n. sp., very close to *P. (Pulchriphyllium) sinense* Liu, 1990, but differs by various distinct characters such as the armature of the mesonotum, shape of the anterior legs, abdomen and abdominal apex. Like *P. sinense*, *P. maethoraniae* n. sp. is only known from the female. A table is given to distinguish between the two species.

**Résumé.** – Une nouvelle espèce de phyllie géante du genre *Phyllium*, de Thaïlande (Phasmatodea, Phylliidae). Une nouvelle espèce de phasme-feuille est décrite de Thaïlande, *Phyllium (Pulchriphyllium) maethoraniae* n. sp., très proche de *P. (Pulchriphyllium) sinense* Liu, 1990, mais s'en distinguant par divers caractères marqués comme la structure du mésonotum, la forme des pattes antérieures, de l'abdomen et de l'apex abdominal. Comme *P. sinense*, *P. maethoraniae* n. sp. est seulement connu par le sexe femelle. Un tableau est donné pour différencier les deux espèces.

**Keywords.** – Leaf insect, new species, female, taxonomy, Thailand, identification key.

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For centuries, the well-known “leaf insects” or “walking leaves” have fascinated people due to their leaf-like shape and coloration and possess an almost perfect camouflage (DURET, 1605). Until today leaf insects are subject to numerous taxonomic and phylogenetic studies and several species have successfully been reared in captivity in Europe (GRÖSSER, 2008).

A photograph showing an interesting female leaf insect, said to be “*Phyllium giganteum* Hausleithner, 1984” from “Malaysia” was noticed in a book (LERAUT & MERMET, 2003: 46, 48), but there was doubt about the identification and origin of the specimen. While rearranging the collection of the family Phylliidae in the Muséum national d'Histoire naturelle (MNHN), in Paris, the illustrated specimen was found and investigation proved it to be a new species, not from Malaysia but from Chiang Mai, Thailand. It is here described as *Phyllium (Pulchriphyllium) maethoraniae* n. sp. Another female of this species is on display in the Thailand Museum, Museum of World Insects, in Chiang Mai, but it was not possible to study it or to get more information about it. Inquiries by the author remained unanswered.

Chiang-Mai is a city in north-western Thailand and the region has been quite well prospected for over 25 years. Many Phylliidae have been collected in this area but all seems to represent either *Phyllium (Phyllium) westwoodii* Wood-Mason, 1875 (see HENNEMANN *et al.*, 2009), *P. (Phyllium) rayongii* Thanasinchayakul, 2006<sup>1</sup> (not included in HENNEMANN *et al.*, 2009, who were unaware of this paper), *P. (Pulchriphyllium) bioculatum* Gray, 1832 (SORPONGPAISAL & THANASINCHAYAKUL, 2006), or other unidentified species all looking fairly unlike the one described in the present paper. Hence, it may be assumed that the peculiar new species described herein is apparently rare in Thailand.

**Material and methods.** – For measuring of the specimen, a digital caliper was used and measurements are given in millimetres to 0,01 mm. Photographs of the specimen were taken with two digital cameras: a Nikon D80 with a 105 mm AF-S Micro Nikkor lens and a Canon EOS 50 D with a 65 mm MP-E lens. The specimen was examined in detail using a binocular microscope Leica MZ 7.5.

<sup>1</sup> Possibly a synonym of *Phyllium (Phyllium) westwoodii* Wood-Mason, 1875; awaits confirmation.

Genus *Phyllium* Illiger, 1798

Currently there are 53 species of Phylliidae described, 41 of which belong to the genus *Phyllium* Illiger, 1798 (BROCK, 2015). The genus *Phyllium* is divided into the two subgenera *Phyllium* and *Pulchriphyllium* Griffini, 1898 (HENNEMANN *et al.*, 2009). *Phyllium maethoraniae* n. sp. keys out to the subgenus *Pulchriphyllium* and belongs in the *bioculatum* species-group, which also contains the similar *P. giganteum* Hausleithner, 1984, and *P. sinense* Liu, 1990. *P. maethoraniae* n. sp. and *P. sinense* can easily be confused because the general body shape is very similar (see table II), but tergum VIII with lateral margins strongly elongated separate them from other species (see LIU, 1990). Characters which place *Phyllium maethoraniae* n. sp. in the subgenus *Pulchriphyllium* are: the number of teeth on the pars stridens; shape of the antennomeres; shape of the meso- and praescutum, which is roughly as long as wide; not expanded anterior portion of the mesopleurae, which are more or less gradually widening towards the posterior; presence of exterior lobes on the pro-, meso- and metatibiae and undeveloped alae (see also figures 1-3 and details in the description).

*Phyllium (Pulchriphyllium) maethoraniae* n. sp.

HOLOTYPE : ♀, Thailand, Chiang Mai, Doi Pui (MNHN).

The female holotype of *Phyllium maethoraniae* n. sp. is in good condition (fig. 1-3) although the green colour is slightly faded. Unfortunately, the specimen was dissected for a better conservation and the abdomen is empty (fig. 2). Claws and arolium are missing (fig. 1-2) on the right posterior leg (fig. 3).

**Diagnosis.** – Very broad, with a spectacular and unusual shape of the abdomen. Mesonotum almost smooth. Legs with large foliaceous lobes, very large on profemora and mesofemora. Protibiae with exterior and interior lobes. Lateral margins of tergum VIII strongly lobed, with the posterior margin deeply curved inward and forming on each side a rounded posteriorly directed lobe which distinctly surpasses the abdominal apex. Tergum X not surpassing distinctly tergum IX.

**Description.** – Length of the body: 94.6 mm. More or less green for the holotype and the specimen in the Museum of World Insects in Thailand. Tarsi light brown.

**Head** large, somewhat depressed and longer than wide, rounded in dorsal view. Antennae light brown, shorter than head and with 9 segments. Antennae roundly triangular in cross-section and with a bulge ventrally. Antennomere III with 30 teeth on pars stridens. Small eyes pale reddish brown (fig. 3).

**Thorax.** Pronotum shorter than head, roundly trapezoidal and narrowed rearward, with anterior margin about 2× broader than posterior margin, the latter rounded. A distinct indentation in centre. On each edge, a large tubercle at posterior part with apex seeming cut. Mesonotum almost smooth, with a swollen ridge in centre and only median line slightly rugose. Slightly longer than pronotum, armed with more 6-9 small denticles on lateral margins. Mesopleurae armed with 10 small teeth-like dentations. Tegmina large, foliaceous and reaching beyond the posterior margin of tergum VII. Alae not developed. Pro-, meso- and metasternum smooth.

**Legs** with large lobes. Exterior lobe of profemora very large, roughly triangular in shape, irregularly dentate at the hinder margin (4 teeth) and much larger than interior lobe. Interior lobe more rounded with 4 weakly defined, rounded teeth. Protibiae with distinct rounded exterior and interior lobes. Exterior lobe widening towards apex of tibiae, interior lobe roundly triangular. Mesofemora with exterior and interior lobes large, triangular, foliaceous and dentate. Exterior lobe with 5 teeth in apical half and interior lobe with about 9 teeth dispersed over entire length. Metafemora with a long but not broad exterior lobe looking like a smooth ridge and a dentate interior lobe. Interior lobe with about 10 teeth which increase in size in apical half. Meso- and metatibiae only with a distinct rounded exterior lobe.

**Abdomen** very broad, leaf-like. Tergum VIII with lateral margins strongly deflexed, elongated and forming a fairly slender, posteriorly directed lobe, which distinctly projects over apex of abdomen. Posterior margin deeply curved inward. Lateral margins of tergum IX slightly curved inward, with outer angles

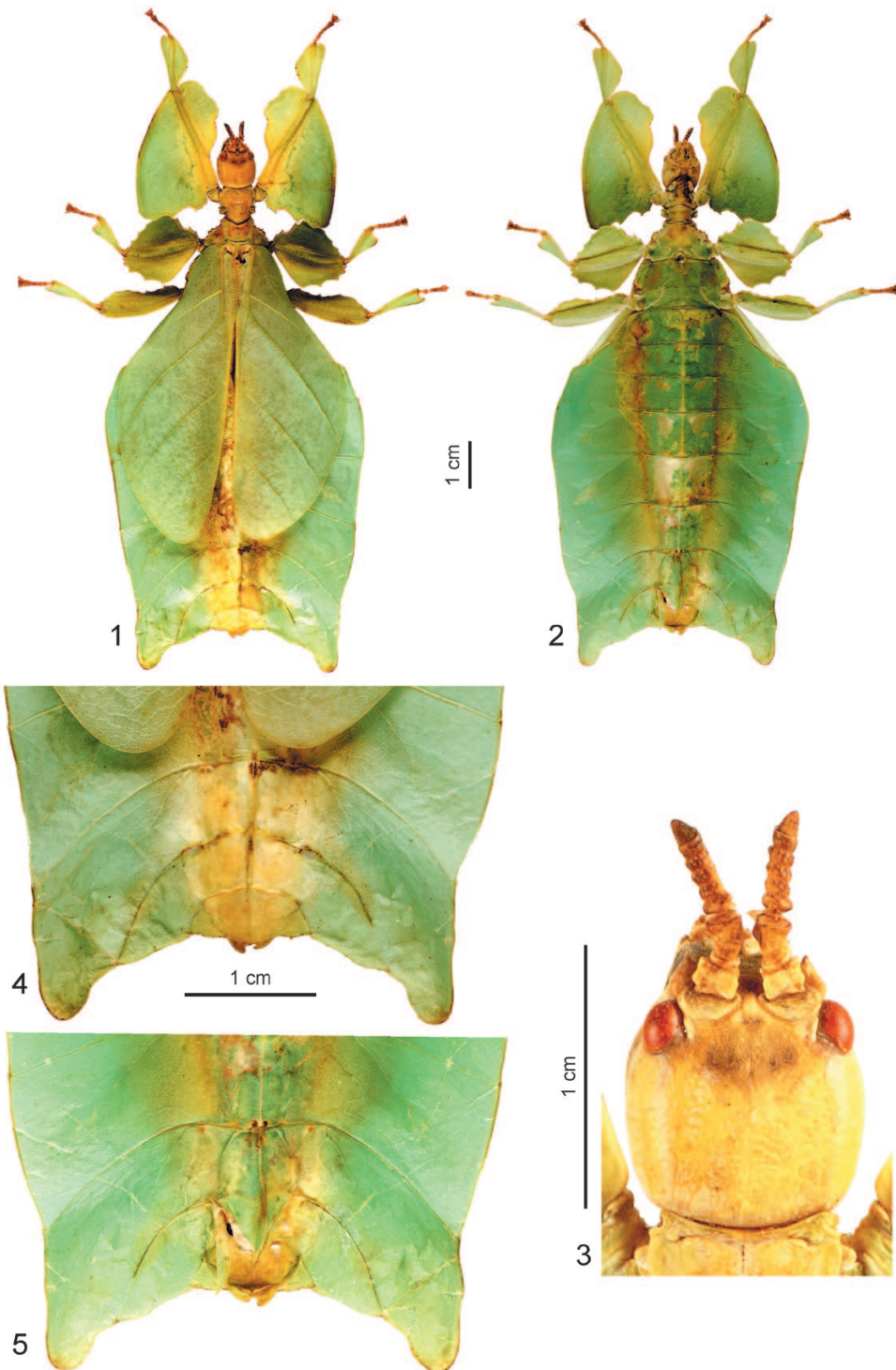


Fig. 1-5. – *Phyllium (Pulchriphyllium) maethoraniae* n. sp., ♀ holotype. – 1-2, Dorsal and ventral view. – 3, Head detail, dorsal view. – 4-5, Details of dorsal and ventral view of the abdominal segments VI-X.

slightly projecting over apex of tergum X. Tergum X subtriangular, apex rounded, slightly surpassing tergum IX. Sterna smooth. Subgenital plate tapered to a triangular point, reaching half way along tergum X. Valve extended half of tergum X. Cerci compressed and spatulate, slightly exceeding apex of tergum X (fig. 1-2, 4-5).

**Etymology.** – Named after Mae Thorani (sometimes noted Phra Toranee or Jao Meh Torani) who is the goddess of mother earth. She is the personification of Gaia and cited in old texts about the life of Buddha.

**Differentiation.** – *Phyllium (Pulchriphyllium) maethoraniae* n. sp. and *Phyllium (P.) sinense* are similar and obviously closely related species but can be separated by various characters (tables I-II; LIU, 1990) even if some variation must be assumed for both species. Within the *bioculatum* species-group of the subgenus *Pulchriphyllium* this new species is apparently closest to *P. sinense*.

The distance between the type-localities of these two species is considerable, about 1200 km: Northwestern Thailand (Chiang Mai) for *P. maethoraniae* n. sp. and South China (Hainan) for *P. sinense*. The new species is distinctly larger than *P. sinense* (table I). The pronotum is longer in *P. maethoraniae* n. sp.

Table I. – Measurement (mm) of female holotypes of *Phyllium (Pulchriphyllium) sinense* Liu (after LIU, 1990) and *Phyllium (P.) maethoraniae* n. sp.

	<i>P. sinense</i>	<i>P. maethoraniae</i>
<b>Body</b>	78.0	94.63
<b>Head</b>	–	10.38
<b>Antennae</b>	–	5.75
<b>Pronotum</b>	4.2	7.15
<b>Mesonotum</b>	4.9	8.28
<b>Elytra</b>	47.5	58.90
<b>Profemora</b>	13.5	20.45
<b>Protibiae</b>	7.5	11.48
<b>Protarsi</b>	–	6.11
<b>Mesofemora</b>	10.1	14.4
<b>Mesotibiae</b>	7.0	10.88
<b>Mesotarsi</b>	–	6.67
<b>Metafemora</b>	10.0	16.67
<b>Metatibiae</b>	9.5	13.71
<b>Metatarsi</b>	–	6.51

The mesonotum is almost smooth whereas in *P. sinense* with four large but very weakly defined and rounded teeth (in *P. sinense*, one large and more rounded tooth near the leg base and 4 sharp teeth near apex). The exterior and exterior lobes of the mesofemora are less acute than in *P. sinense*. The interior lobes of the metafemora are less developed and also less acute. In general, the teeth of the lobes of the extremities appear less acute than in *P. sinense* but it is well known that quite some variation is possible in the same species. The posteriorly directed lobes of abdominal tergum VIII are more slender with the apex narrower than those of *P. sinense*. The lateral margin of tergum IX is slightly curved inward whereas it is straight in *P. sinense*. The subgenital plate is longer

and almost reaches half way along tergum X whereas it only reaches one third along tergum IX in *P. sinense*. The cerci appear to be more narrowed than in *P. sinense* (see also table II).

Table II. – Differences between the female of *Phyllium (Pulchriphyllium) maethoraniae* n. sp. and *Phyllium (P.) sinense* Liu.

<i>P. sinense</i>	<i>P. maethoranae</i>
Mesonotum with a distinct and strongly granulose and rugose median ridge	Mesonotum almost smooth, with just the median ridge very slightly rugose
Interior lobe of profemora with 5 sharp teeth near apex	Interior lobe of profemora with 4 very weak lobe-like teeth
Lateral margin of abdominal tergum IX straight	Lateral margin of abdominal tergum IX slightly curved inward
Subgenital plate reaching only one third along tergum IX basis	Subgenital plate reaching half way along tergum X
Distribution: South China	Distribution: NW-Thailand

## CONCLUSION

A new giant species of leaf insect is described as *Phyllium (Pulchriphyllium) maethoraniae* n. sp. based on a single female in MNHN. It is very much hoped that more specimens of this spectacular new species will be encountered in the future in order to obtain a better knowledge on the variation, biology and distribution, and knowing whether it is really rare or not. Hopefully future records will reveal the still unknown male and egg.

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